Naval Education and Training Command

NAVEDTRA 11011
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Training Manual (TRAMAN) and Nonresident Training Course (NRTC)

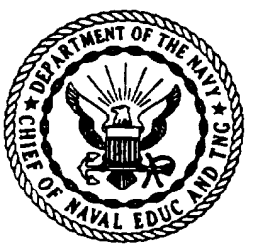
Construction Mechanic Basic, Volume 2

Only one answer sheet is included in the NRTC. Reproduce the required number of sheets you need or get answer sheets from your ESO or designated officer.

Although the words "he," "him," and "his" are used sparingly in this manual to enhance communication, they are not intended to be gender driven nor to affront or discriminate against anyone reading this text.

CONSTRUCTION MECHANIC BASIC, VOLUME 2

NAVEDTRA 11011



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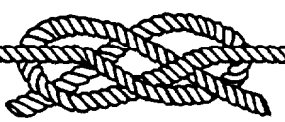

PREFACE

Construction Mechanic Basic, Volume 2, NAVEDTRA 11011, is an eight chapter training manual (TRAMAN). This TRAMAN, along with its companion nonresident training course (NRTC), which is included in this volume, forms a self-study package that will greatly aid students in fulfilling the requirements for advancement.

Designed for individual study, this TRAMAN provides subject matter that relates directly to the occupational standards of the Construction Mechanic rate. There are embedded questions throughout the text that allow the students to check their understanding of a specific topic.

The NRTC provides the usual way a student can satisfy the requirements for completing the TRAMAN. The assignments in the NRTC include supporting questions designed to guide the student through the subject matter of the TRAMAN.

This TRAMAN and the NRTC were prepared by the Naval Education and Training Professional Development and Technology Center (NETPDTC), Pensacola, Florida, for the Chief of Naval Education and Training. Technical assistance was provided by the Naval Facilities Engineering Command, Alexandria, Virginia; the Naval Construction Training Center, the Naval Construction Battalion Center, and the Civil Engineering Support Office, Port Hueneme, California; the Naval Construction Training Center, the Naval Construction Battalion Center, and the 20th Naval Construction Regiment, Gulfport, Mississippi.

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THE UNITED STATES NAVY

GUARDIAN OF OUR COUNTRY

The United States Navy is responsible for maintaining control of the sea and is a ready force on watch at home and overseas, capable of strong action to preserve the peace or of instant offensive action to win in war.

It is upon the maintenance of this control that our country's glorious future depends; the United States Navy exists to make it so.

WE SERVE WITH HONOR

Tradition, valor, and victory are the Navy's heritage from the past. To these may be added dedication, discipline, and vigilance as the watchwords of the present and the future.

At home or on distant stations as we serve with pride, confident in the respect of our country, our shipmates, and our families.

Our responsibilities sober us; our adversities strengthen us.

Service to God and Country is our special privilege. We serve with honor.

THE FUTURE OF THE NAVY

The Navy will always employ new weapons, new techniques, and greater power to protect and defend the United States on the sea, under the sea, and in the air.

Now and in the future, control of the sea gives the United States her greatest advantage for the maintenance of peace and for victory in war.

Mobility, surprise, dispersal, and offensive power are the keynotes of the new Navy. The roots of the Navy lie in a strong belief in the future, in continued dedication to our tasks, and in reflection on our heritage from the past.

Never have our opportunities and our responsibilities been greater.

CONTENTS

The Nonresident Training Course (NRTC) follows the Index

SUMMARY OF CONSTRUCTION MECHANIC BASIC

VOLUME 1

Construction Mechanic Basic, Volume 1, NAVEDTRA 11010, consists of chapters on Technical Administration; Principles of an Internal Combustion Engine; Construction of an Internal Combustion Engine; Gasoline Fuel Systems; Diesel Fuel Systems; and Cooling and Lubricating Systems.

VOLUME 2

Construction Mechanic Basic, Volume 2, NAVEDTRA 11011, consists of chapters *on* Basic Automotive Electricity; Automotive Electrical Circuits and Wiring; Hydraulic and Pneumatic Systems; Automotive Clutches, Transmissions, and Transaxles; Drive Lines, Differentials, Drive Axles, and Power Train Accessories; Construction Equipment Power Trains; Brakes; and Automotive Chassis and Body.

SAFETY PRECAUTIONS

Safety is a paramount concern for all personnel. Many of the Naval Ship's Technical Manuals, manufacturer's technical manuals, and every Planned Maintenance System (PMS) maintenance requirement card (MRC) include safety precautions. Additionally, OPNAVINST 5100.19 (series), Naval Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat, and OPNAVINST 5100.23 (series), NAVOSH Program Manual, provide safety and occupational health information. The safety precautions are for your protection and to protect equipment. Cautions and warnings of potentially hazardous situations or conditions are highlighted, where needed, in each chapter of this TRAMAN. Remember to be safety conscious at all times.

During equipment operation and preventive or corrective maintenance, the procedures may call for personal protective equipment (PPE), such as goggles, gloves, safety shoes, hard hats, hearing protection, and respirators. When specified, use of PPE is mandatory. You must select PPE appropriate for the job since the equipment is manufactured and approved for different levels of protection. Most machinery, spaces, and tools requiring you to wear hearing protection are posted with hazardous noise signs or labels. Eye hazardous areas requiring you to wear goggles or safety glasses are also posted. In areas where corrosive chemicals are mixed or used, an emergency eyewash station must be installed. Anytime a procedure does not specify the PPE, and you are not sure, ask your safety officer.

All lubricating agents, oil, cleaning material, and chemicals used in maintenance and repair are hazardous materials. Examples of hazardous materials are gasoline, coal distillates, and asphalt. Gasoline contains a small amount of lead and other toxic compounds. Ingestion of gasoline can cause lead poisoning. Coal distillates, such as benzene or naphthalene in benzol, are suspected carcinogens. Avoid all skin contact and do not inhale the vapors and gases from these distillates. Asphalt contains components suspected of causing cancer. Anyone handling asphalt must be trained to handle it in a safe manner.

Hazardous materials require careful handling, storage, and disposal. OPNAVINST 4110.2 (series), *Hazardous Material Control and Management,* contains detailed information on the hazardous material program. Additionally, PMS documentation provides hazard warnings or refers the maintenance man to the Hazardous Materials User's Guide. Material Safety Data Sheets (MSDS) also provide safety precautions for hazardous materials. All commands are required to have an MSDS for each hazardous material they have in their inventory; therefore, additional information is available from your command's Hazardous Material Coordinator.

Recent legislation and updated Navy directives implemented tighter constraints on environmental pollution and hazardous waste disposal. OPNAVINST 5090.1 (series), *Environmental and Natural Resources Program Manual,* provides detailed information. Your command must comply with federal, state, and local environmental regulations during any type of construction or demolition. Your supervisor will provide training on environmental compliance.